Dividend Policy Changes in Japan: a break in 2004

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I. Introduction

Corporate executives say that they try to pay a constant amount of dividends, and that they change the amount only when they perceive a permanent change in the corporate income; See Lintner (1956), Fama and Babiak (1986), Brav *et al.* (2005) for U.S. cases, and Hanaeda and Serita (2008) for Japanese. Their responses seem to be compatible with a signaling view: Firms pay dividend to disclose insider's view on future corporate income to outside market participants. If the signaling were the most important motivation for firms to pay, or to change the amount of, dividends, then large established firms wouldn't do so because informational asymmetry between managers and market participants tends to be small for such firms. Fama and French (2001) show that surviving U.S. companies become to pay less and less dividends; both the number of firms that pay dividends and the amounts have been decreasing. We may argue that this is consistent with the signaling view.

In contrast, however, dividends in Japan have been far from constant in 2000's, although Japanese firms had paid relatively constant dividends for decades until 2001.[2] Figure 1 shows a total amount of dividends paid by large non-financial firms in Japan. The amount almost quadrupled in 2006, for example, compared with the amount in the constant payment periods, and have decreased afterwards. With 1989 - 2002 data, Denis and Osobov (2008) document the proportion of dividend paying firms declines over time in all six countries that includes Japan. It is true that in their sample period some Japanese

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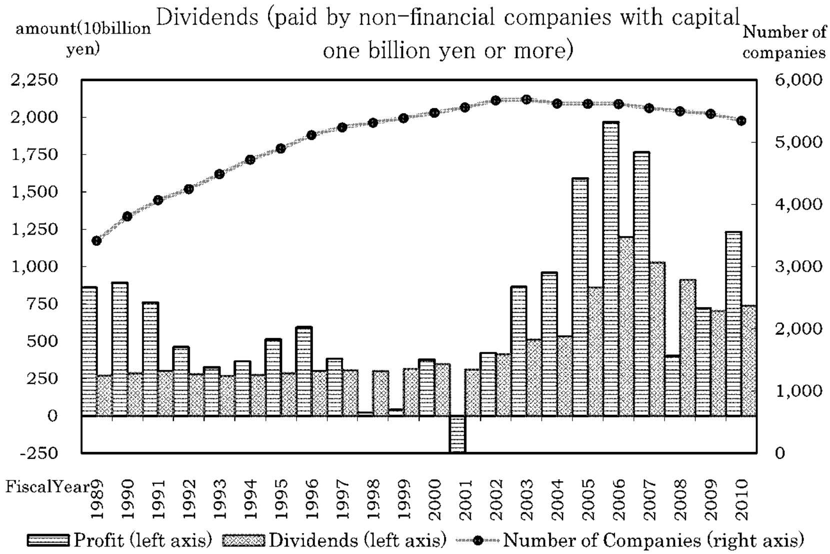
[2] Dewenter and Warther(1998) report that omissions and initiations of dividends were more frequent during 1983-1993 and stock price responses to them were smaller in Japan than those in U.S. They interpret this as evidence that signaling effects of dividends, especially those of keiretsu-member firms, are weaker in Japan.

firms had financial difficulties that could force them to stop paying dividends. But Figure 1 indicates the total amount was almost constant in Japan for the period,[3] irrespective of large fluctuations in the profit.

Figure 1. Dividends and Profits



Source: Annual Statistics from *Financial Statistics of Corporations by Industry*, Policy Research Institute, Ministry of Finance.

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[3] Note that, the total amounts of dividends paid by the firms had been almost constant until fiscal year 2001, though the number of firms that the Ministry of Finance casted the survey increased from 3,805 to 5,559 as the line in Figure 1 shows. The number of firms increased to 5,686 in year 2003, and stayed roughly at the same level. An increment of firms was less than 2.3%, (5,686-5,559)/5,559, but the growth rate of dividends was more than 380%; 3,100 billion yen in 2001 increased to 11,980 billion yen in 2006. The Ministry of Finance has been sending an inquiry to all firms with capital more than one billion yen. It is less likely that firms that pay larger dividends started to answer the inquiry, and that firms that pay smaller dividends failed to answer the inquiry. If the inquiry response changed, we might observe net increase in dividends paid while the number of firms stayed constant. In this study we fix the firms through the sample period. We see as similar pattern as Figure 1 for our sample firm, though we skipped to report it here.

The purpose of this paper is to confirm there were changes in dividend policies of Japanese firms in 2000's, and to characterize the firms that changed the policy. The rest of the paper is organized as follows. Section II describes our sample selection process, and characteristics of dividend policies of the sample firms. Especially we see that the dividend concentration pointed out in the literature happened in Japan only after the break in the dividend policies in the middle of 2000's. Section III introduces a lifecycle theory of dividends of DeAngelo and DeAngelo (2007) that we expect to describe well the Japanese dividend policies, and equations to be estimated. Immediately follow statistical evidences for changes in dividend policies in Japan. A structural break happened between March 2003 and March 2004. Section IV analyzes behavior of firms in the latter period. More than 55% of firms change dividend per share according to the realized performance. Section V concludes.

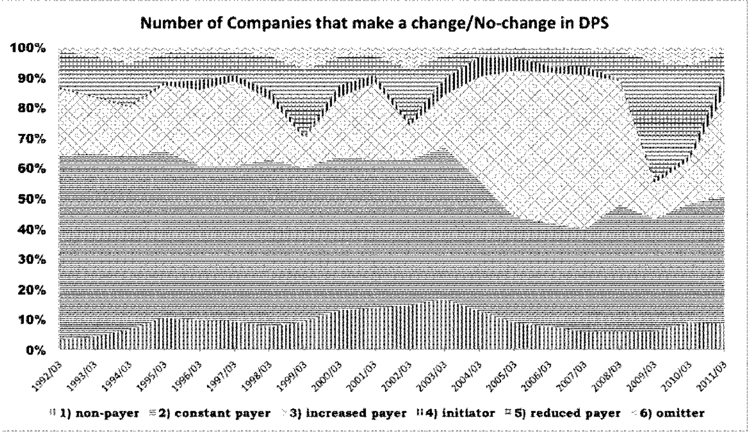
II. Sample firms and a break in the 2000's

We choose non-financial firms that were listed in the Tokyo Stock Exchange as of March 31st of 2011, with its accounting period that ends in the last day of March. We further restrict the sample firms to be publicly traded as of March 31st of 1991; they were listed either in the Tokyo Stock Exchange, or in the other local exchanges, or the shares were traded at the OTC market, which is called JASDAQ today. We drop firms that went delisted but re-listed between 1991 and 2011. By fixing the sample firms in this way, we are free from any effect caused by changes in the composition of sample. Our sample consists 804 firms, covering 29 non-financial industries; three major industries, Electrical equipment manufacturer (96 firms), Chemical (83 firms), and Machinery (excluding electrical, 82 firms), compose 1/3 of the sample. Three minor industries, Mining, Airline, and Fisheries, Forestry and Agricultural, contain two firms. We use data from *Nikkei Financial Quest* online data service, supplementing it with financial statements filed by each firm when necessary.

To grasp the dividend policy of the sample, we collect data of annual dividend per share (DPS), adjust for stock splits and merges, and calculate changes in DPS. The amount of dividends paid to investors is equal to DPS times the number of shares outstanding (reducing the number of treasury stocks, if any). It can differ from the previous year's distribution when the number of shares changes even if DPS is the same. Talking of dividend policies of a firm, DPS is more appropriate than the total amount paid out as dividends. Furthermore, DPS is the information reported in company releases, which investors pay primary attention to. For the adjustment of stock splits and merges, let us show the method by an example. NTT, a telecommunication company, distributed 5,500 yen per share as interim dividend in June 2008, and then splitted one share into ten shares in January 2009 when the electronic share certificate system began in Japan. A stockholder at the end of March 2009 received 55 yen per share as final dividend. We calculate annual DPS as (5,500/100)+55 = 110 yen for the accounting period ending March 2009. This number is comparable with annual DPS of 120 yen for the period ending March 2010.

Changes in DPS are classified into six categories: 1) no dividends both in the current and in the previous accounting periods, 2) the same amount of (positive) dividends in the current as one in the previous period, 3) an increase in dividends from a positive payment in the previous period, 4) a dividend initiation (no dividend in the previous period), 5) a decrease in dividends, still paying a positive amount, and 6) a dividend halt (no payment in this period, but positive payment was made in the previous period). Figure 2 displays percentage shares of the six categories from 1992 to 2011. The period ending March 2003 seems to be a break point. The sum of the shares of constant payers and non-payers was 63% on average from 1992 to 2003. It dropped to 43.8% in the period ending March 2005, which is roughly equal to the average of 45% from 2005 to 2011. After five years of growing numbers of increased payers, the period ending March 2009 observed massive numbers of decreased payers, reflecting the slump

Figure 2. Changes in Dividend Per Share

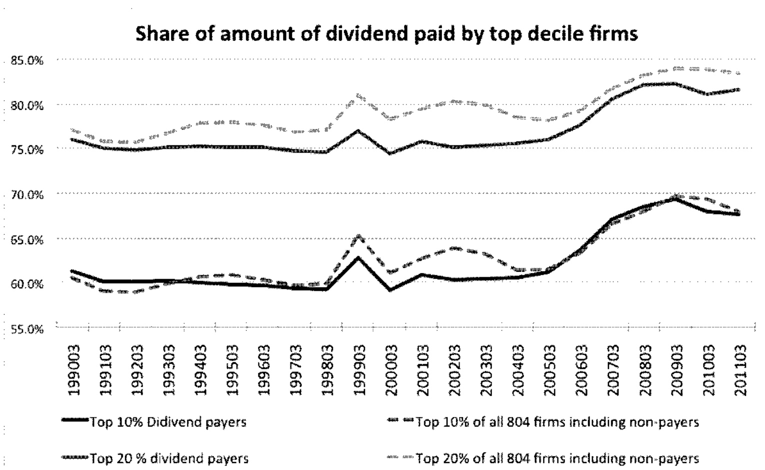


Source: *Nikkei Financial Quest*.

following the default of the Lehman Brothers. For the recent two years, increased payers swell and decreased payers shrink. Since these changes have happened among the fixed member of firms, it is indicative that some of the companies changed the dividend policy.

DeAngelo *et al.* (2004) find most of aggregate dividends in U.S. were paid by a relatively small number of firms, and top payers' share are increasing. Denis and Osobov (2008) confirm similar tendency in their six countries. To see how much our sample firms contribute to this concentration, we calculate ratios of the sum of dividends paid by the top 20% firms to the sum of dividends paid by our sample firms. The top 20% are the firms whose amount of dividend paid to common shares is in the largest decile or in the second largest decile. Denis and Osobov (2008) report increasing average shares of the top 20% firms: 73.3% for 1989-1993, 77.6% for 1994-1998, and 82.8% for 1999-2002 in Table 10. As Figure 3 shows, our corresponding number is largely constant: 75% for 1990-2003. It began to increase only after 2004 toward 82% of 2011. We also display a series of the top 10% payers. Again, it is a roughly constant, 60%, up to 2003. Two broken lines in Figure 3 are drawn based on decile calculations with all sample firms including non-payers[4]. Contrary to Denis and Osobov (2008), the concentration has not

Figure 3. Concentration of Dividends



Source: *Nikkei Financial Quest*.

[4] The 1990 bumps caused by a temporary double payment of NTT, which was a commemorative distribution for a new listing of its subsidiary, NTT Docomo, to the Tokyo Stock Exchange.

intensified until 2003; it occurred after 2003.

Note that the above figures indicate that dividend policies didn't move during a transition year around 2000: the transition from unconsolidated to consolidated financial accounting reporting. The Asian crisis in 2008 and the burst of a dot-com bubble in 2001 might force to reduce dividends (Figure 2), but they didn't affect the large payers (Figure 3). A new Companies Act became effective on 2008 May, and resolution at shareholders' meetings is no longer required to determine an amount of dividends since then. But this change, if any, would appear in the 2009 March numbers[5]. The new law doesn't seem to be a reason for the breaking point observed between 2003 and 2004.

Table 1 shows the distribution of amount of dividends from March 1991 to March 2011 periods, sorted by a size-rank of a firm. Following the method Fama and French (2001) contrive to cope with problems occurring in studies that cover a long period, we assign a categorical number (rank) as a firm size. Especially we calculate decile points of market capitalization of all firms listed in the first and the second sections of Tokyo Stock Exchange at the each end of March from 1991 to 2011[6]. For each year, we assign to our sample firm a number (from one to ten) according to the Tokyo Stock Exchange capitalization category, which the sample firm's market capitalization belongs to. Reflecting our sample selection process that requires the firms to survive for 20 years, the Observation column in Table 1 shows the largest size-rank '10' contains 14% of the entire observations[7]. Our sample firms grow in the market capitalization during our sample period from 1991 to 2011, relative to the entire market. The dividend amounts of firms in size-ranks 9 and 10 are so large that we will execute separate estimations in the following.

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[5] Under the new law, dividends distributed in June are recorded as occurred in the accounting period starting April, while they had been treated as dividends of the previous period (ending March) under the old law. Our dividend data keep the same practice as one that was exercised under the old law, since no firms in our sample started quarterly or more frequent (and more flexible) dividend distribution that became possible under the new Act. We regard payments in the first quarter as dividends corresponding to the previous accounting year.

[6] In this calculation we include both financial and relatively newly listed firms such as those in the IT industry.

[7] We drop five firms due to lack of some data used below, and the final number of firms become 799, and total number of observation is 799 × 21 = 16,799.

Table 1. Dividends to Common stocks **(million yen)**

Size(rank)	Mean	Std. Dev.	Min	Max	Observations	
1	38.2	43.9	0	163	395	(2.4%)
2	88.5	73.9	0	394	1,122	(6.7%)
3	133.8	101.2	0	771	1,538	(9.2%)
4	205.0	144.1	0	771	1,671	(10.0%)
5	287.8	192.0	0	2,836	1,760	(10.5%)
6	412.9	266.6	0	1,740	1,959	(11.7%)
7	598.8	408.6	0	3,043	1,928	(11.5%)
8	992.9	667.4	0	5,079	1,947	(11.6%)
9	1,869.0	1,386.0	0	12,750	2,101	(12.5%)
10	9,872.3	16,529.0	0	184,154	2,358	(14.1%)
Total	1,923.3	7,023.8	0	184,154	16,779	(100%)

III. Theories tested

In explanation of observed payout policies, DeAngelo *et al.* (2008) emphasize theoretical importance of information asymmetry that embeds agency costs and security valuation problems. Among them, a lifecycle theory considers a balance between cash needs from firm's investment opportunity set and agency costs arising from Jensen's free cash flow, for example. A maturity hypothesis on dividends has focused on the former, and an agency hypothesis such as a disciplinary role of dividends (Easterbrook (1984)) has focused on the latter. DeAngelo *et al.* (2006) capture a stage of the lifecycle of a firm by a ratio of retained earnings to total equity, RE/TE, and show that the propensity to pay dividends is positively related to the ratio. Denis and Osobov (2008) add supportive evidence.

Given the 2004 break in Figures 2 and 3, here we estimate following dividend policy equations with coefficient-dummy variables, to detect changes in a dividend policy to be estimated. Especially, we estimate the following panel equation:

$$\begin{aligned} \mathrm{Div}_{it} = {} & b0 + (b1 + c1\ \mathrm{D2004}_t)\ \mathrm{RE/TE}_{it} + (b2 + c2\ \mathrm{D2004}_t)\ \mathrm{ROA}_{it} \\ & + (b3 + c3\ \mathrm{D2004}_t)\ \mathrm{MK/BK}_{it} + (b4 + c4\ \mathrm{D2004}_t)\ \mathrm{SGR}_{it} + v_i + e_{it}, \end{aligned}$$

$i = 1, 2, \ldots, 799, t = 1991, 1992, \ldots, 2011,$ (1)

where Div $_{it}$: an amount of dividend a firm *i* pays in year *t*, RE/TE $_{it}$: a ratio of retained earnings to total equity of a firm *i* in year *t*, ROA $_{it}$: a ratio of earnings before interest and taxes to total asset of a firm *i* in year *t*, MK/BK $_{it}$: a ratio of market value of equity to book value of equity of a firm *i* in year *t*, SGR $_{it}$: sales growth rate of a firm *i* in year *t*, calculated as (Sales $_{it}$/Sales $_{it-1}$)-1, D2004$_t$: a dummy variable which takes value one if year $t \geq 2004$, and takes value zero otherwise, and two error terms v_i and e_{it}. If the estimated coefficients c1 – c4 on the dummy D2004 are significantly different from zero, then we say a change in the dividend policy occurred in the period ending March 2004.

For a test of the lifecycle theory, RE/TE is the key variable that indicates a lifecycle stage of a firm. Firms with a high RE/TE value are in a distribution stage; they can earn necessary funds by themselves, need not rely on outside money, and therefore they should pay dividends. A low RE/TE indicates that the firm needs outside fund. So they are less likely to distribute. The other variables in the equation (1) are control variables. A current profitability is measured by ROA. Growth opportunities are measured by current values of MK/BK or of SGR.

The lifecycle theory originally concerns the decision to distribute or not. The previous studies, DeAngelo *et al.* (2006), and Denis and Osobov (2008), run a logit model, in which the explained is a binary variable, Pay $_{it}$; it takes one if the firm *i* in year *t* pays dividend, and takes zero otherwise. We also run a panel logit equation:

$$\begin{aligned} &\text{Probability}[\text{Pay}_{it} = 1] = \text{Logit}[\, b0 + (b1 + c1\ \text{D2004}_t)\ \text{RE/TE}_{it} \\ &\quad + (b2 + c2\ \text{D2004}_t)\ \text{ROA}_{it} + (b3 + c3\ \text{D2004}_t)\ \text{MK/BK}_{it} \\ &\quad + (b4 + c4\ \text{D2004}_{it})\ \text{SGR}_{it} + v_i\,], \\ &\quad i = 1, 2, \ldots, 799,\ t = 1991, 1992, \ldots, 2011, \qquad (2) \end{aligned}$$

where $Logit(x) = 1/(1+e^{-x})$.

III.1 Estimation results

As is seen in Table 1, the average amounts of dividends of the firms in the largest and the second largest categories differ so much from those in the rest. Larger companies pay larger amount of dividends. So we estimate panel equations separately; one for firms in the two largest categories, and one for firms in the rest. Each uses the same set of explanatory variables, except for size dummies, and we label them as Model 1 to Model 3.

Table 2 reports the estimated coefficients of the fixed effect panel model, as well as several test statistics. Below the R-squares, *F*-test statistics against a pooling model are reported. In all cases, a pooling model is rejected. Although we omit to report the

Table 2. Determinants of Dividends

Dependent variable:	Div in size rank 9 or 10 (Fixed Effect Model)			Div in size rank 1 to 8 (Fixed Effect Model)		
Explanatory variables	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
RE/TE	419.07 ***	649.15 ***	414.74 ***	36.01 ***	32.44 ***	35.62 ***
RE/TE * D2004	161.82 **	509.71 ***	132.33 *	16.75 ***	17.23 ***	15.90 ***
ROA	-1,941.88	-7,130.46	-6,809.46	34.61	-192.18	79.96
ROA * D2004	45,225.39 ***	70,665.64 ***	55,750.98 ***	3,051.23 ***	3,411.62 ***	3191.38 ***
MK/BK	-5.00		2.20	-5.79 ***		-5.59 ***
MK/BK * D2004	152.22 ***		150.23 ***	1.19		1.34
SGR		5,337.72 **	5,093.85 **		0.07	1.50
SGR * D2004		-9,383.65 ***	-10672.41 ***		-162.20 ***	-155.88 ***
sizerank5				50.54 ***	47.24 ***	50.74 ***
sizerank6				130.58 ***	122.37 ***	130.37 ***
sizerank7				252.65 ***	238.70 ***	252.47 ***
sizerank8				503.75 ***	483.97 ***	503.01 ***
constant	2,571.93 ***	1,786.56 ***	2,555.05 ***	163.92 ***	152.11 ***	160.79 ***
sigma_u	8,162.74	8,820.14	8,184.14	343.96	348.02	343.47
sigma_e	8,461.00	8,622.97	8,433.57	267.29	267.41	267.00
rho	0.48	0.51	0.48	0.62	0.63	0.62
N(observations)/ N(groups)	4269 / 321	4269 / 321	4269 / 321	11709 / 675	11705 / 675	11705 / 675
R^2: within	0.26	0.23	0.27	0.31	0.31	0.32
: between	0.02	0.01	0.02	0.41	0.40	0.42
: overall	0.13	0.09	0.13	0.40	0.39	0.40
F test that all u_i=0	F(320,3942)=14.04	F(320,3942)=14.45	F(320,3942)=14.17	F(674, 11024)=10.39	F(674, 11020)=10.63	F(674, 11018)=10.40
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Breush/Pagan LM test for	Chi^2(01)=10392.46	Chi^2(01)=10335.64	Chi^2(01)=10426.31	Chi^2(01)=5791.97	Chi^2(01)=5978.39	Chi^2(01)=5812.10
random effect	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hausman specification test	Chi^2(6)=96.79	Chi^2(6)=214.37	Chi^2(6)=87.40	Chi^2(10)=141.63	Chi^2(10)=314.94	Chi^2(12)=235.89
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Asterisks show significance level:* p<0.05; ** p<0.01; *** p<0.001.

estimated result for a random effect model, Breush/Pagan LM test statistics of a random effect model against a pooling model are reported. In all cases, a pooling model is rejected. To select either a fixed effect model or a random effect model, Hausman specification test statistics are reported. In all cases, a random model is rejected.

The estimated coefficients for RE/TE are positive, and statistically significant for all cases. This is consistent with the previous studies that support the lifecycle theory of dividends. The estimated coefficients for RE/TE* D2004 are also positive and statistically significant. This indicates that firms pay more dividends in the years after March 2004, even if the situations surrounding firms are the same as before. The positive and statistically significant coefficients for ROA* D2004 indicate that firms pay larger dividends only when they observe high profitability in the years after March 2004. This also implies another change in the dividend policies.

As for MK/BK that is supposed to capture growth opportunities, the statistically significant and negative estimates for the firms in the smaller size categories are consistent with the lifecycle theory. But statistically significant *positive* estimates of MK/BK* D2004 for the firms in the largest size categories are hard to reconcile with the lifecycle theory.

Now turn to the estimation of the logit model (2). The dependent variable is a binary (size doesn't matter) so that we estimate models with all samples. Table 3 reports odds ratio: a number greater than one implies the explanatory variable has a positive effect on the propensity to pay dividends, and a number smaller than one implies the explanatory variable has a negative effect. As before we estimate three models: a fixed effect model, a random effect model, and a pooling model. Below the log likelihood of the model, we report Hausman test statistics for a fixed effect model against a pooling model. In all cases, a pooling model is rejected. Lagrange Multiplier test statistics reported as LM test for random indicate that a pooling model is rejected. In the bottom line, Hausman specification test statistic of a fixed effect model against a random effect model is reported for Model 2. It rejects a random model. For Models 1 and 3, we skip to report test statistic, because the difference of estimated variance-covariance matrices, used for the statistic, is not positive semi-definite, and the test statistic looses meaning. We cannot judge whether a fixed effect model is better than a random effect model in these cases. Inspecting the estimated result for the random model reveals that they are similar to the result of the fixed effect model. So we skip to report the estimated result for the random model here, and discuss based on the fixed effect model reported in Table 3.

Table 3. Determinants of Propensity to Pay Dividend

Dependent variable: Pay

	(Fixed Effect Model)		
Explanatory variables	Model 1	Model 2	Model 3
RE/TE	2.81 ***	3.16 ***	2.81 ***
RE/TE * D2004	2.92 ***	2.46 ***	3.11 ***
ROA	3.93E+15 ***	5.48E+16 ***	4.58E+15 ***
ROA * D2004	0.00 ***	0.00 ***	0.00 ***
MK/BK	1.12 ***		1.12 ***
MK/BK * D2004	0.91 **		0.91 **
SGR		0.65	0.66
SGR * D2004		8.35 **	6.81 **
sizerank2	2.80 ***	3.09 ***	2.78 ***
sizerank3	7.91 ***	9.29 ***	7.79 ***
sizerank4	28.25 ***	34.75 ***	28.14 ***
sizerank5	60.11 ***	80.78 ***	60.02 ***
sizerank6	117.69 ***	173.98 ***	116.83 ***
sizerank7	226.46 ***	371.69 ***	231.55 ***
sizerank8	259.70 ***	466.44 ***	263.20 ***
sizerank9	657.78 ***	1328.89 ***	665.13 ***
sizerank10	1044.234 ***	2568.254 ***	1075.526 ***
N(observations)/ N(groups)	6019 / 301	6019 / 301	6019 / 301
Log(likelihood)	-1415.55	-1423.94	-1410.70
Hausman specification test	Chi^2(15)=175.01 0.0000	Chi^2(15)=190.27 0.0000	Chi^2(15)=175.96 0.0000
LM test for random	Chi^2(01)=2235.02 0.0000	Chi^2(01)=2226.86 0.0000	Chi^2(01)=2231.57 0.0000
Hausman specification test	-	Chi^2(15)=27.38 0.0258	-

Odds ratios are reported: a number greater than 1 indicates positive effect.
Asterisks show significance level:* p<0.05; ** p<0.01; *** p<0.001.

The variable RE/TE has statistically significant positive effects, which supports the lifecycle theory. The lifecycle theory suggests that growth opportunity should have a negative effect. SGR has a negative effect, but it is not statistically significant. MK/BK indicates positive and statistically significant effect, which is against the theory.

Note that D2004 shows statistically significant effects in all cases. This strongly supports that the firms changed the propensity to pay dividends after March 2003.

In sum, we find mostly supportive evidence for the lifecycle theory of dividends through the panel estimations of the equations (1) and (2). Furthermore, some of the Japanese firms changed the amount to distribute as dividends and the propensity pay in the accounting period 2003.

IV. How are they changed?

From the signs of the estimated coefficient of D2004 dummies in Table 2, firms in a distribution stage (with large RE/TE) have been paying larger amount of dividends in the year 2003 and on than before, irrespective of their firm size category. Firms faced with smaller growth opportunities (with small SGR), and those attained high profitability (with high ROA) also have been paying larger amount of dividends in the year 2003 and on. In this high dividend era, 55% of firms change DPS from the previous year as Figure 2 shows, while less than 40% of firms were "changers" before 2003. Who are they? What are characteristics of those changers?

To answer these questions, we estimate the following logit models that explain the labels defined in the section II for the periods from 2004 to 2011:

$$\begin{aligned} &\text{Probability}[\mathit{Changer}_{\,it} = 1] = \text{Logit}[\ b0 + b1\ \text{RE/TE}_{\,it} + b2\ \text{ROA}_{\,it} \\ &\qquad + b3\ \text{MK/BK}_{\,it} + b4\ \text{SGR}_{\,it} + \textstyle\sum_{k=2}^{k=10} \text{SIZE}(k)_{\,it} + v_{it}], \\ &\qquad i = 1, 2, \ldots, 799,\ t = 2004, 2005, \ldots, 2011, \qquad (3) \end{aligned}$$

where $\text{SIZE(k)}_{\,it}$: a size(rank) dummy variable which takes value one if the market capitalization of a firm *i* in year *t* belongs to the k-th decile in the Tokyo Stock Exchange, and takes value zero otherwise, and the other explanatory variables are the same as in the equations (1) and (2).

As for the explained variable *Changer,* we define five types according to the DPS change classifications 3 to 6; Initiators(3), Omitters(6), Increasers(3 and 4), Reducers(5 and 6), and Changers(3-6). These take value one if the firm *i* in year *t* is in the category specified by the number(s), and takes value zero otherwise. For example, $\text{Initiator}_{\,it} = 1$ for firm *i* in year *t* if it pays a positive dividend in year *t* but not paid in the previous year *t-1*.

Table 4 reports odds ratios calculated from the estimated results of a fixed effect model. Diagnostic test statistics show the following order: a fixed effect model > a random effect model > a pooling model. An exception is the case of a random effect model against a pooling model for Omitters, where the following order is indicated: a fixed effect model > a pooling model > a random effect model. In all cases a fixed effect model is selected.

Table 4. Determinants of Changers

Dependent variable:	Increasers	Reducers	Initiators	Omitters	Changers
Explanatory variables			(Fixed Effect Model)		
RE/TE	0.68 ***	1.63 ***	0.72 ***	0.48	0.97
ROA	9.07E+17 ***	1.03E-14 ***	5.16E+18 ***	7.97E-11 ***	20.50 *
MK/BK	1.04 ***	0.97 *	1.04 **	0.66 *	1.10 ***
SGR	24.98 ***	0.00 ***	17.35 ***	0.31	0.58 *
N(observations)/ N(groups)	5855 / 732	4615 / 577	5503 / 688	1032 / 129	5591 / 699
Log(likelihood)	-1898.02	-1026.83	-1757.77	-175.53	-2347.65
Hausman specification test	Chi^2(13) =144.80 0.0000	Chi^2(13) =131.86 0.0000	Chi^2(13) =134.62 0.0000	Chi^2(13) =28.08 0.0000	Chi^2(13) =86.77 0.0000
LM test for random	Chi^2(01) =81.19 0.0000	Chi^2(01) =13.86 0.0000	Chi^2(01) =126.52 0.0000	Chi^2(01) =5.07e-5 0.0000	Chi^2(01) =349.53 0.0000
Hausman specification test	Chi^2(13) =127.86 0.0000	Chi^2(13) =134.78 0.0000	Chi^2(13) =106.44 0.0000	Chi^2(13) =28.09 0.0000	Chi^2(13) =104.09 0.0000

Odds ratios are reported: a larger number than 1 indicates positive effect.
Asterisks show significance level:* $p<0.05$; ** $p<0.01$; *** $p<0.001$.
Size dummy variables (Size2-10) are used in estimation, but we do not report mostly insignificant results here.

Firms that increase or initiate dividends are those experiencing high profitability (high ROA). Firms realizing low profitability decrease or omit dividends. For example, from March 2004 to March 2008, Toyota Motor had achieved historically highest net revenues every year, and increased DPS from 45 yen to 140 yen. The global recession pulled down its revenues by 20% in March 2009, and the firm reduced DPS to 100 yen in March 2009 and to 45 yen in March 2010. Although we expect to capture long-term investment opportunities by MK/BK and SGR, the estimated results for these two variables are quite similar to those of ROA. Firms that change DPS follow current performances that all three variables indicate.

The lifecycle stage variable RE/TE has a statistically significant negative effect on

Increasers and on Initiators, and statistically positive effect on Reducers. Firms with a large RE/TE ratio are expected to be in a distribution stage, so that they are less likely to begin to pay dividends, and to increase "stable" dividends.

Firms that change dividends (Changers) have high MK/BK, high ROA, and low SGR. A neither lifecycle stage nor size of a firm have any effect to be a Changer.

V. Concluding Remarks

Relying on the lifecycle theory of dividend, we have seen dividend policies of Japanese firms from 1991 to 2011 to confirm some firms changed the policies in the middle of 2000's. The lifecycle theory is supported: the ratio of retained earnings to total equity well captures a lifecycle stage of firms, and explain both the propensity to pay and the amount of dividends in Japan. However, no theory explains the changes: some firms resigned from a stable distributor, and became a short-term payer that follows the current corporate performance. The most statistically significant indicator for changers is a ratio of market value to book value of equity, which is supposed to represent firm's investment opportunity set, but allows other interpretations. Exploration for the reasons for the change remains for future research.

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